Rough-Legged Hawk
(*Buteo lagopus*)

Dr. Lloyd Glenn Ingles

Status

Federal: None

State: None

Other: None

Recovery Plan: None

Placer Legacy Category: 3

Distribution

North America

Rough-legged Hawk is pan-boreal in distribution, breeding in taiga and tundra habitats in both the new and old worlds. In North America, Rough-legged Hawks breed in arctic and subarctic habitats in Canada and Alaska. Breeding occurs as far west as the Aleutian islands and as far east as Newfoundland. (Bechard and Swem 2002.)

Rough-legged Hawks migrate across the boreal forest to winter in open habitats in southern Canada and across most of the continental United States except the southeast and coastal portions of the southwest (Bechard and Swem 2002).

California

Rough-legged hawks do not breed in California. In winter, the species occurs throughout much of the state but appears to be most common in the northern portions, particularly along the east side of the Sierra Nevada (Garrison 1993). The abundance and distribution of this species in California during winter is strongly influenced by climate and food availability. (Bechard and Swem 2002.) Garrison (1993) concluded from the Audubon Society's Christmas Bird Count (CBC) data that Rough-legged Hawks were most abundant in the North Interior, North Sierra, South Sierra, and Central Valley CALVEG regions (Parker and Matyas 1979).

Placer County Phase I Planning Area

Historical

There is no information available on the historic distribution of Rough-legged Hawks in Placer County. The easternmost portion of the Phase I Planning Area is within the North Sierra CALVEG region.

Current

Rough-legged Hawks regularly occur in small numbers on the Valley floor in western Placer County (Webb 2003).

Population Status & Trends

North America

Rough-legged Hawk may be one of the most abundant raptor species in the world (Ehrlich et al. 1988; Bechard and Swem 2002). Although no historical data on Rough-legged Hawk populations are available, North American populations are probably stable (White 1994). There is no evidence for any change in breeding populations (Palmer 1988), although evaluation of population changes can be complicated by pronounced cycles in breeding and wintering populations may be related to food resources. The North American wintering population south of the Canadian provinces and Alaska was estimated to be approximately 49,600 birds in 1986 based on CBC data (Johnsgard 1990). CBC data reflected declines from 1966 to 1988 in Delaware and in the 1990s in New Jersey (Walsh et al. 1999; Hess et al. 2000).

California

The California Rough-legged Hawk population has been found to follow a 3–4 year cycle, although this trend was not statistically significant in eight geographic regions (Garrison 1993). There is also some evidence to suggest that populations in California increased between 1950 and 1989 based on CBC data, although the conclusions of these data are suspect due to other confounding factors (Garrison 1993).

Placer County Phase I Planning Area

As noted above, small numbers of Rough-legged Hawks occur regularly during the winter in western Placer County (Webb 2003). There is no evidence that populations of this species are declining or increasing in western Placer County.

Natural History

Habitat Requirements

Rough-legged Hawks breed in taiga and tundra habitats at arctic and subarctic latitudes. Habitats used for nesting include boreal forest, boreal forest–tundra ecotones, treeless tundra, and uplands and alpine regions. Nesting occurs along the coast, along inland river valleys, and in other open country with cliffs, bluffs, or other substrates suitable for nest placement. Nests are typically built on cliffs, ledges, rock outcroppings, escarpments, and eroded riverbanks, although columnar rocks, artificial structures, and trees are also used occasionally (Palmer 1988; Johnsguard 1990; Bechard and Swem 2002).

Rough-legged Hawks forage primarily in open areas such as wet meadows, bogs, marshes, riparian areas, pastures, and shrubland and grassland uplands. In winter, they also use cultivated and abandoned fields (Bechard and Swem 2002). Rough-legged Hawks are absent from northern regions where the average minimum January temperature is below -23ºC (-10ºF) (Root 1988), and are most abundant in areas with less than 1,020 millimeters (40 inches) of annual precipitation (Palmer 1988).

Reproduction

Rough-legged Hawks are at least serially monogamous, forming pair bonds that are maintained at least through the breeding season, if not longer. There is some evidence that pairs may form in wintering areas, where birds roost and perch in pairs; also, they sometimes migrate in pairs (Palmer 1988; Bechard and Swem 2002). They generally arrive on the breeding grounds in April and May, and nest building begins soon after arrival. The nest is constructed of sticks, bones, weeds, grass, and other debris and is lined with grass, down, feathers, and the fur of prey animals. A clutch of two to seven eggs is laid between early May and late June, depending on weather and prey abundance (Brown and Amadon 1968; Kessel 1989). Larger clutches may be laid in good lemming years (Brown and Amadon 1968). Incubation lasts for approximately 28–31 days, and is conducted mostly by the female. Nestlings fledge

at approximately 36–40 days. Fledglings remain dependent on their parents for another 4–6 weeks postfledging, with the period of dependence perhaps continuing into fall migration. (Bechard and Swem 2002.)

Dispersal Patterns

There is little information on natal dispersal distances, and the information that is available is poorly documented. The distance between natal site and subsequent breeding site of Rough-legged Hawks in Russia was reported to be 1,955 kilometers (1,215 miles) ± 1.079 (0.67), but the number of birds in this study was not reported (Galushin 1974).

Pairs often use the same site year after year, a predictable pattern given the limited availability of nest sites. However, because no studies have been conducted using marked individuals, breeding site fidelity is essentially unknown (Bechard and Swem 2002). There is some evidence of fidelity to wintering sites in California (Garrison and Bloom 1993).

Longevity

An average life span of 20.7 months based on 48 recoveries of dead birds has been reported (Bechard and Swem 2002). The oldest known wild individual was 17 years 1 month (U.S. Geological Survey 2003).

Sources of Mortality

Forty-six of 48 Rough-legged Hawks recovered dead and reported to the U.S. Geological Survey Bird Banding Laboratory died from anthropogenic causes, primarily vehicle collisions. Other sources of human-related mortality include shooting, trapping, and collisions with towers and wires (Keran 1981). Eggs and nestlings are occasionally taken by Jaegers (*Stercorarius* sp.), Snowy Owls (*Nyctea scandiaca*), arctic foxes (*Alopex lagopus*), and at least once by a grizzly bear (*Ursus arctos*) (Bechard and Swem 2002).

Behavior

Rough-legged Hawks have been reported to defend a small territory around the nest site during the breeding season. In some areas, they have been reported to defend winter territories against conspecifics as well as Red-tailed Hawks (*Buteo jamaicensis*), Northern Harriers (*Circus cyaneus*), Prairie Falcons (*Falxo mexicanus*), and Common Ravens (*Corvus brachyrhynchos*) (Bechard and Swem 2002). However, where food is plentiful, Rough-legged Hawks can occur in concentrations and are apparently not territorial (Schnell 1967).

Home range size during the breeding season is unknown. In winter, Rough-legged Hawks occasionally roost communally and have overlapping home ranges. The reported sizes of winter home ranges are highly variable, ranging from 6 to more than 530 square kilometers (2.3 to 205 square miles). (Watson 1986.)

Rough-legged Hawks feed primarily on lemmings (*Lemmus sibiricus, Dicrostonyx groenlandicus*) and voles (*Microtus* spp.) during the breeding season, and on voles, mice (*Peromyscus* spp., *Mus musculus*), and shrews (*Blarina* spp. and *Sorex* spp.) in winter. Occasionally, these hawks will take small birds, ground squirrels, and rabbits, particularly in summer. (Bechard and Swem 2002.)

Rough-legged Hawks hunt from perches or on the wing, probably depending on availability of perches, wind conditions, and possibly other factors. This species is known for its characteristic form of "hover hunting" in light winds (Bechard and Swem 2002).

Movement and Migratory Patterns

Rough-legged Hawk is a medium-distance migrant. The entire population moves from the breeding grounds in the arctic and subarctic to open country in southern Canada and the continental United States. Departure from the breeding grounds begins in late August or September, with individuals arriving at wintering areas from October through December. The timing of migration is highly variable, possibly due to variations in cyclic prey populations. Fall migration can begin as early as February, but more typically occurs in mid-March and early April. (Bechard and Swem 2002.)

Ecological Relationships

Several aspects of the ecology of Rough-legged Hawks, including breeding phenology, reproductive success, timing of migration, social behavior, and distribution and abundance, have been linked to their reliance on cyclic prey populations, although supporting evidence has at times been wanting (Bechard and Swem 2002). Rough-legged Hawks frequently share nesting cliffs with Peregrine Falcons (*Falco peregrinus*), Gyrfalcons (*Falco rusticolus*), and Common Ravens, nesting as close as 30 meters in some cases (White and Cade 1971). In winter, Rough-legged Hawks will kleptoparasitize (rob food from) Red-tailed Hawks, Northern Harriers, and Short-eared Owls (*Asio flammeus*), and are in turn occasionally kleptoparasitized by White-tailed Kites (*Elanus leucurus*), Red-tailed Hawks, and Common Ravens; ravens will often mob a Rough-legged hawk in groups of two to seven. (Bechard and Swem 2002.)

Population Threats

Due to the remoteness of most breeding habitats, population threats are more likely to be a problem in wintering areas. Potential threats include shooting and trapping; collisions (e.g., with vehicles, wind turbines, power poles); and habitat loss (Bechard and Swem 2002). Of these, habitat loss in wintering areas is perhaps the greatest threat. Development of agricultural lands and urban sprawl has been identified as potential threats to wintering populations in California (Garrison and Bloom 1993).

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